

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-28. (canceled)

29. (currently amended) A mould set for use in a method of moulding ~~plasties~~ plastic articles wherein a preform is injection-moulded in an injection moulding cavity and the injection-moulded preform is blow-moulded in a blow-moulding cavity, said mould set comprising:

an array of injection-moulding cavities; and

an array of generally elongate blow-moulding cavities, each of the blow-moulding cavities having a neck region and a longitudinal axis,

wherein each of the cavities in each of the arrays ~~[[being]]~~ is defined by at least two mould parts separable in a respective mould separation direction,

~~wherein~~ the mould separation directions of said injection-moulding cavities and of said blow-moulding cavities each define a common mould separation direction whereby, ~~in use,~~ the mould set ~~may be opened~~ opens and closes in the common mould separation direction to release both of the injection-moulded preforms and the blow-moulded products,

~~wherein the longitudinal axes of the blow-moulding~~
~~cavities are arranged with their longitudinal axes extending~~extend
generally perpendicularly to the common mould separation
direction~~[[,]]~~ and ~~with their~~the neck regions are disposed adjacent
to an [[the]] edge of the mould set [[so as]] to be externally
accessible in a direction that is transverse ~~transversely~~ relative
to the mould-separation direction and to the [[axis]]axes of said
opening and closing movement, and

the longitudinal axes of the injection-moulding cavities
are arranged to extend generally parallel to the common mould
separation direction .

30. (previously presented) A mould set as claimed in
Claim 29, wherein the blow-moulding cavities are disposed in an
array to one or both sides or towards the top and/or bottom of the
mould set.

31. (previously presented) A mould set as claimed in
Claim 29, wherein the injection-moulding cavities are disposed in a
generally central array in the mould set.

32. (previously presented) A mould set as claimed in
Claim 29 wherein each injection-moulding cavity is aligned with a
respective blow-moulding cavity.

33. (previously presented) A mould set as claimed in Claim 32, wherein the blow-moulding cavities are arranged as a group of a preset number (n) of rows (or columns) of a preset number (m) of cavities on one side of the mould set and a generally symmetric group of said preset number (n) of rows (or columns) of (m) cavities on an opposite side of the mould set, with the necks of the blow-moulding cavities facing outwardly on the edges of the mould sets, and the injection-mould cavities are disposed between the two groups of blow-moulding cavities, and arranged in a rectangular array of $(2n \times m)$ cavities.

34. (previously presented) A mould set as claimed in Claim 33, comprising at least two rows (or columns) of blow-moulding cavities on each side of said moulding set, the rows (or columns) being stacked in the direction of the common mould-separation direction.

35. (previously presented) A mould set as claimed in Claim 32, wherein the blow-moulding cavities are disposed in two rows (or columns) of cavities at equal spacing, one to either side of the mould set, with the rows or columns being offset with respect to each other by one half the cavity spacing, and the injection-moulding cavities are disposed in a single column or row disposed generally centrally between the moulding cavities and each being aligned with a respective blow-moulding cavity.

36. (previously presented) A mould set according to Claim 29, comprising two main body portions, and a plurality of modular, removable or replaceable mould set components.

37. (previously presented) A mould set according to Claim 36, wherein said modular mould set components include one or more of the following:

injection cores,
injection neck formers,
injection cavity plates (housings),
injection cavities, and
blow cavities.

38. (currently amended) An injection moulding apparatus for injection ~~[[()]]~~and stretch[()] blow-moulding of ~~plastics~~ plastic articles, said apparatus comprising:

a mould set, comprising:

an array of injection-moulding cavities; and

an array of generally elongate blow-moulding cavities,
each of the blow-moulding cavities having a neck region and a longitudinal axis,

wherein each of the cavities in each of the arrays ~~[[being]]~~is defined by at least two mould parts separable in a respective mould separation direction,

~~wherein~~ the mould separation directions of said injection-moulding cavities and of said blow-moulding cavities define a common mould separation direction whereby, ~~in use~~, the mould ~~[[may be]] opens and closes~~~~opened~~ in the direction along the axis of the common mould separation direction to release ~~both the~~ injection-moulded preforms and ~~[[the]]~~ blow moulded products, and

~~wherein~~ the longitudinal axes of the blow moulding cavities are arranged ~~with their longitudinal axes extending to~~ extend generally perpendicularly to the common mould separation direction~~[[,]]~~ and ~~with their~~the neck regions are disposed adjacent to an [[the]] edge of the mould set ~~[[so as]]~~ to be externally accessible ~~transversely~~ in a direction that is transverse relative to the axis of said opening and closing movement~~[[;]]~~,

the longitudinal axes of the injection-moulding cavities are arranged to extend generally parallel to the common mould separation direction,

an injection means for injecting plastics material into said injection-moulding cavities to produce said injection-moulded preforms~~[[;]]~~,

a mould opening means for opening and closing said mould set ~~[[in use]]~~ to allow release of the injection-moulded preforms and the blow-moulded products~~[[;]]~~,

a preform transfer means for transferring the injection-moulded preforms from the injection-moulding cavities to the blow-moulding cavities~~[[;]]~~, and

a blow-moulding means associated with said blow-moulding cavities and operable for blow-moulding the injection-moulded preforms thereinto.

39. (previously presented) An injection moulding apparatus according to Claim 38, including two facing platen means mounted on a base structure, wherein a first part, or array of parts, of said mould set is secured to one of said platen means and a second part, or array of parts, of said mould set is secured to the other of said platen means, the apparatus further including platen drive means for effecting relative linear movement of said mould parts between a closed position and an open position, to serve as said mould opening means.

40. (previously presented) An injection-moulding apparatus according to Claim 39, wherein said blow-moulding means are disposed generally transversely of said mould set and are operable to apply blow-moulding pressure via said neck region.

41. (previously presented) An injection moulding apparatus according to Claim 40, including elongate stretch means operable to be introduced in use transversely into the cavity within a preform held in a blow-moulding cavity, thereby to apply a stretching force before or during the blow-moulding.

42. (previously presented) An injection-moulding apparatus according to Claim 38, including an array of injection core means and an array of injection neck forming means, for cooperating with said array of injection-moulding cavities.

43. (previously presented) An injection-moulding apparatus according to Claim 42, wherein the number of injection-mould core means is equal to the number of injection-moulding cavities.

44. (previously presented) An injection-moulding apparatus according to Claim 42, wherein the number of injection-mould core means is an integral multiple of the number of injection-moulding cavities.

45. (previously presented) An injection-moulding apparatus according to Claim 42, wherein the number of injection neck-forming means is equal to the number of injection-moulding cavities.

46. (previously presented) An injection-moulding apparatus according to Claim 42, wherein the number of injection neck-forming forming means is an integral multiple of the number of injection-moulding cavities.

47. (previously presented) An injection-moulding apparatus according to Claim 45, wherein the array of neck-forming means is operable in use to transfer the injection-moulded preforms from the array of injection-moulding cavities along at least part of the way to the array of blow-moulding cavities.

48. (previously presented) An injection-moulding apparatus according to Claim 45, including perform transfer means for transferring in use injection-moulded preforms to the blow-moulding cavities from at least part of the way along the path from the injection-moulding cavities.

49. (previously presented) An injection-moulding apparatus according to Claim 48, wherein said preform transfer means comprises an array of neck gripping means for engaging in use the neck of a preform.

50. (previously presented) An injection moulding apparatus according to Claim 41, which comprises actuation means for introducing and withdrawing said elongate stretch means to and from the blow-moulding cavities, said actuation means being further operable to apply movement to move said preforms from said injection-moulding cavities to said blow-moulding cavities and/or to transfer said blow-moulded products from said blow-moulding cavities.

51. (currently amended) An injection moulding apparatus ~~according to Claim 38~~ for injection blow-moulding of plastic articles, said apparatus comprising:

a mould set, comprising:

an array of injection-moulding cavities; and

an array of generally elongate blow-moulding cavities,
each having a neck region and a longitudinal axis,

wherein each of the cavities in each of the arrays is
defined by at least two mould parts separable in a respective mould
separation direction,

the mould separation directions of said injection-
moulding cavities and of said blow-moulding cavities define a common
mould separation direction whereby the mould set opens in the
direction of the common mould separation to release injection-
moulded preforms and blow moulded products, and

the longitudinal axes of the blow moulding cavities are
arranged to extend generally perpendicularly to the common mould
separation direction and the neck regions are disposed adjacent to
an edge of the mould set to be externally accessible in a direction
that is transverse relative to the opening and closing movement,

an injection means for injecting plastics material into
said injection-moulding cavities to produce said injection-moulded
preforms,

a mould opening means for the opening and closing movement of said mould set to allow release of injection-moulded preforms and blow-moulded products,

a preform transfer means for transferring the injection-moulded preforms from the injection-moulding cavities to the blow-moulding cavities,

a blow-moulding means associated with said blow-moulding cavities and operable for blow-moulding the injection-moulded preforms thereinto, and

~~further including~~a thermal conditioning means for exposing said injection moulded preforms to a thermal conditioning step following injection moulding thereof and prior to said blow moulding.

52. (currently amended) A method of blow-moulding ~~plastics~~plastic articles, which comprises~~comprising~~ the steps of:

providing a mould set, comprising:

an array of injection-moulding cavities, each of the injection-moulding cavities having a longitudinal axis; and

an array of generally elongate blow-moulding cavities, each of the blow-moulding cavities having a neck region and a longitudinal axis,

wherein each of the cavities in each of the arrays ~~[[being]]~~is defined by at least two mould parts separable in a respective mould separation direction,

~~wherein~~ the mould separation directions of said injection-moulding cavities and of said blow-moulding cavities define a common mould separation direction whereby, ~~in use,~~ the mould ~~may be opened~~ opens and closes in the common mould separation direction to release ~~both the~~ injection-moulded preforms and ~~[[the]]~~ blow moulded products,

~~wherein~~ the longitudinal axes of the blow moulding cavities ~~are arranged with their longitudinal axes extending~~ extend generally perpendicularly to the common mould separate direction~~[[,]]~~ and ~~with their~~ the neck regions disposed adjacent to an ~~[[the]]~~ edge of the mould set and are externally accessible in a direction that is transversely ~~transversely~~ relative to the axis of said opening and closing movement;

the longitudinal axes of the injection-moulding cavities are arranged to extend generally parallel to the common mould separation direction,

locating a plurality of previously injection-moulded preforms in said blow-moulding cavities;

closing said mould set;

forming injection-moulded preforms using said injection-moulding cavities;

stretching and/or blow-moulding said previously injection-moulded preforms into said blow-moulding cavities;

opening said mould set to release said injection-moulded preforms and said blow-moulded products; and

transferring said injection-moulded preforms to said blow-moulding cavities.

53. (previously presented) A method according to Claim 52, operated cyclically, wherein in each period between the mould closing and the mould opening, a plurality of injection-mould preforms are formed in the injection-moulding cavities and a plurality of previously formed injection moulded performs are blow-moulded in said blow-moulding cavities.

54. (currently amended) ~~A method according to Claim 52~~
of blow-moulding plastic articles, comprising the steps of:

providing a mould set, comprising:

an array of injection-moulding cavities; and

an array of generally elongate blow-moulding cavities,

each of the blow-moulding cavities having a neck region,

wherein each of the cavities in each of the arrays is defined by at least two mould parts separable in a respective mould separation direction,

the mould separation directions of said injection-moulding cavities and of said blow-moulding cavities define a common mould separation direction whereby the mould set opens and closes in the common mould separation direction to release injection-moulded preforms and blow moulded products,

the blow moulding cavities extend generally
perpendicularly to the common mould separate direction and the neck
regions disposed adjacent to an edge of the mould set and are
externally accessible in a direction that is transverse relative to
the axis of said opening and closing movement;

locating a plurality of previously injection-moulded
preforms in said blow-moulding cavities;

closing said mould set;

forming injection-moulded preforms using said injection-
moulding cavities;

stretching and/or blow-moulding said previously
injection-moulded preforms into said blow-moulding cavities;

opening said mould set to release said injection-moulded
preforms and said blow-moulded products; and

transferring said injection-moulded preforms to said
blow-moulding cavities,

wherein said injection moulded preforms are exposed to a
thermal conditioning step following release from injection-moulding
thereof and prior to said blow-moulding.